

We claim:

1. A method for enabling the creation and management of platform-independent applications, the method comprising:

generating a platform-independent data superstructure defining the appearance
5 and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

instantiating the application in the device in accordance with the superstructure,
updating, in response to generated application events, information in a segment
of the superstructure associated with the application events, the application events

10 including events generated by the application instantiated in the device and representative of an application state, and

updating, in accordance with the superstructure segment update, the application state in the device, wherein:

the superstructure is an XML information structure,

15 application appearance and behavior are encapsulated within the superstructure, and

application events are expressed to the superstructure via a pathway including a device-native operating system (OS) and a superstructure-dedicated OS acting as an intermediary between the device-native OS and the superstructure, whereby:

20 a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application, and

the appearance and behavior of the application can be propagated with consistency across heterogeneous device types, to enable cross-device interoperability, replicability, and compatibility of applications and data with a consistency of user

25 experience.

2. A method for enabling the creation and management of platform-independent applications, the method comprising:

generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

instantiating the application in the device in accordance with the superstructure,

5 updating, in response to generated application events, information in a segment of the superstructure associated with the application events, the application events including events generated by the application instantiated in the device and representative of an application state, and

10 updating, in accordance with the superstructure segment update, the application state in the device, wherein:

the superstructure is a hierarchical information structure,

application appearance and behavior are encapsulated within the superstructure, and

15 application events are expressed to the superstructure via a pathway including a device-native operating system (OS) and a superstructure-dedicated OS acting as an intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application, and

20 the appearance and behavior of the application can be propagated with consistency across heterogeneous device types, to enable cross-device interoperability, replicability, and compatibility of applications and data with a consistency of user experience.

3. The method of claims 1 or 2 further comprising:

25 generating a message containing a data object of a defined type operable to instantiate the application in a device,

transmitting the message to a device operable to instantiate the application in accordance with the data object,

receiving the message at the device, and

instantiating the application in the device in accordance with the data object in the received message.

4. The method of claim 3 wherein the instantiating of the superstructure inside
5 the target device occurs substantially when the application is invoked.

5. The method of claim 3 wherein the instantiating of the superstructure inside the target device occurs at an application provisioning time prior to application run-time.

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6. The method of claim 3 further wherein:

a provisioning application on a first device locates within its operating environment a first superstructure for a new application superstructure to be expressed to a second device;

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the provisioning application generates a defined data object to be used to express the new application superstructure to the second device;

the data object is transmitted to the second device via a message; and

the second device creates a new application superstructure from the data object in the message.

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7. The method of claim 3 further wherein:

a provisioning application on a first device locates within its operating environment a predefined data object that expresses a new application superstructure for a second device;

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the predefined data object is transmitted to the second device via a message; and

the second device creates its own copy of the new application superstructure from the data object in the message.

8. The method of claim 3 further wherein:

a first device maintains an application capable of accepting input from a user to create an interactive message;

the first application translates an operational portion of the message into a new
5 superstructure-based application operable to display the message or cause interactive operations within the message; and

the first application initiates the transmission of the superstructure of the new application to a receiving device.

10 9. The method of claim 3 further wherein:

the transmission of the superstructure includes converting the superstructure into a temporary form that is transmitted, received, and decoded back into an original form on the receiving device; and

the receiving device maintains an application that receives the superstructure in
15 its temporary form, decodes it, and causes the message-bearing superstructure to operate, thereby rendering the message.

10. The method of claims 1 or 3 wherein, for a given state of a selected application, the organization of the superstructure is substantially invariant, regardless
20 of the device, platform or device-native operating system environment in which the associated application is instantiated, so as to maintain a consistent application appearance and behavior across heterogeneous devices, platforms or device-native operating system environments.

25 11. The method of claims 1 or 3 wherein the superstructure defines rules of appearance and behavior of the application which are substantially invariant across heterogeneous devices, platforms or device-native operating system environments.

12. The method of claims 1 or 3 wherein substantially identical application source code can be used across heterogeneous devices, platforms or device-native operating system environments.

5 13. The method of claim 1 or 3 wherein the application includes a user interface, and wherein the user interface has a substantially identical appearance and behavior across heterogeneous devices, platforms or device-native operating system environments.

10 14. The method of claim 1 wherein operation of the application is implemented through operations on the superstructure, and wherein the operation comprises:
 receiving an application event in the device-native OS,
 receiving data representative of the application event in the superstructure-dedicated OS,
15 applying to the superstructure, in response to the received data, a data object, thereby modifying the superstructure, and
 operating the application in the device in accordance with the modified superstructure.

20 15. The method of claim 14 further comprising generating a modification data object representative of the modification to be applied to the superstructure,
 translating the modification data object into a form suitable for processing by the device-native OS,
 receiving in the device-native OS the translated modification data object, and
25 processing the translated modification data object in the application to update the application.

 16 . The method of claim 15 further comprising expressing within the superstructure a mechanism for generating the modification data object.

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17. The method of claim 15 wherein modifying the superstructure includes transmitting a portion of the superstructure to a processor remote from the device, modifying the transmitted portion, and then returning the modified portion or a new set of operations to update the superstructure.

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18. The method of claim 15 wherein modifying the superstructure includes using device-native code to implement an interface to modify the superstructure.

19. The method of claim 15 wherein the application of changes to the superstructure is implemented by activating program instructions within the superstructure.

20. The method of claim 1 or 3 wherein:
a copy of the superstructure is stored on an application server operable to
15 communicate with a remote device across a network comprising the application server, the remote device, and a communications channel therebetween, and
the superstructure can include data objects operable to instantiate applications in the remote device,
the method further comprising:
20 providing communication of applications between the application server and the remote device by replicating data objects in the superstructure to the remote device via the communications channel, so as to enable instantiation of new data objects and applications from the server into the remote device.

21. A method for enabling the creation and management of platform-independent applications, the method comprising:
generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,
25 instantiating the application in the device in accordance with the superstructure,

updating, in response to generated application events, information in a segment of the superstructure associated with the application events, the application events including events generated by the application instantiated in the device and representative of an application state, and

5 updating, in accordance with the superstructure segment update, the application state in the device, wherein:

the superstructure is an XML information structure,

application appearance and behavior are encapsulated within the superstructure, and

10 application events are expressed to the superstructure via a pathway including a device-native operating system (OS) and a superstructure-dedicated OS acting as an intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application, and

15 the appearance and behavior of the application can be propagated with consistency across heterogeneous device types, to enable cross-device interoperability, replicability, and compatibility of applications and data with a consistency of user experience, and further wherein:

when an application event is expressed to the superstructure, a superstructure
20 object associated with the application event is transmitted via a communications pathway from the device to a remote server,

the server processes the object and creates a new version of the object, responsive to the application event,

the new version of the object is transmitted from the server to the device to
25 replace the existing version of the superstructure object, thus updating the superstructure, and

the superstructure-dedicated OS causes the device-native OS to update the application state in response to the updated superstructure.

22. The method of claim 20 wherein the network further comprises a plurality of heterogeneous devices, communications channels and communications providers servicing the communications channels, and wherein the superstructure defines a given application to have an appearance and behavior that can be propagated with consistency across heterogeneous devices, communications channels and communications providers, to enable cross-device interoperability, replicability, and compatibility of applications and data with a consistency of user experience.

23. The method of claim 22 wherein:

the superstructure can be substantially free of device-specific data, modifications to the superstructure can be made in a substantially device-independent manner, and

a real-time image of an application running in a first device can be expressed across the network from the first device to a second device to yield a viable

instantiation of the application in the second device, regardless of device environment, and

wherein the organization of the superstructure and the meaning of objects within it remains substantially constant between instantiations in various device environments.

24. The method of claim 20 wherein:

the superstructure is capable of completely expressing the running state and functionality of an application operating in a first device, and

the application can be substantially identically instantiated into a second device, without loss of state or functionality, by expressing the superstructure into the second device.

25. The method of claim 1 further comprising validating the superstructure upon or after modification.

26. The method of claim 1 further comprising validating the superstructure after modifying the superstructure, the validation including validation of data updated by processing of an event, so that the modified superstructure cannot express a harmful change to the device-native OS.

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27. The method of claim 1 further wherein an application defined by the superstructure can produce external changes only by invoking operations that operate on the superstructure.

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28. The method of claim 1 further including providing an interface between an application and a system service, wherein the interface is defined by interaction between the superstructure and the superstructure-dedicated OS.

29. An information processing language adapted to interface with the structure defined in any of claims 1 or 20,
the language being expressible entirely within the superstructure and capable of expressing a set of transformations within the superstructure, and
capable of utilizing and modifying data only within the superstructure, so that:
applications utilizing the language cannot affect the state of other applications or
operate outside a bounded application container to affect an underlying device platform.

30. The method of claim 1 wherein the superstructure can contain stylesheets for defining selected application or presentation characteristics.

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31. The method of claim 30 further comprising configuring stylesheets on a per-device basis.

32. The method of claim 30 further comprising configuring stylesheets on a per-group-of-devices basis.

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33. The method of claim 30 further comprising expressing stylesheets within the superstructure, independent of device-specific limitations.

5 34. The method of claim 30 further comprising selecting a stylesheet at runtime.

35. The method of any of claims 1 or 3 wherein an application defined by the superstructure can be transmitted via a peer to peer transaction from a first device in which the application is instantiated, to a second device for instantiation in the second
10 device.

36. The method of claims 1 or 3, further comprising:
converting at least a portion of the superstructure into a device-portable form,
independent of the present state of the application; and
15 reconstructing the original superstructure portion, on the same or different
device context, using the device portable form, without loss of state.

37. The method of claim 36 wherein the reconstructing includes utilizing a new device-specific stylesheet.
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38. A method for enabling the creation and management of platform-independent applications, the method comprising:
generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing
25 device on which the application is to be instantiated, wherein the superstructure can be
serialized in whole or in part at any time,
instantiating the application in the device in accordance with the superstructure,
updating, in response to generated application events, information in a segment
of the superstructure associated with the application events, the application events

including events generated by the application instantiated in the device and representative of an application state, and

updating, in accordance with the superstructure segment update, the application state in the device, wherein:

5 the superstructure is an XML information structure,
application appearance and behavior are encapsulated within the superstructure,
and

application events are expressed to the superstructure via a pathway including a device-native operating system (OS) and a superstructure-dedicated OS acting as an
10 intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application, and

the appearance and behavior of the application can be propagated with consistency across heterogeneous device types, to enable cross-device interoperability,
15 replicability, and compatibility of applications and data with a consistency of user experience.

39. The method of claim 36 further comprising:

using the device-portable form as an intermediate or permanent storage format
20 for recording data within the superstructure.

40. The method of any of claims 1 or 3 wherein the superstructure is organized into objects and classes.

25 41. A method for enabling the creation and management of platform-independent applications, the method comprising:

generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

30 instantiating the application in the device in accordance with the superstructure,

updating, in response to generated application events, information in a segment of the superstructure associated with the application events, the application events including events generated by the application instantiated in the device and representative of an application state, and

5 updating, in accordance with the superstructure segment update, the application state in the device, wherein:

the superstructure is an XML information structure,
application appearance and behavior are encapsulated within the superstructure,
the superstructure can contain data structures adapted to be interpolated,

10 interpolation can occur whenever a device-native operating system requests data from the superstructure,

and

application events are expressed to the superstructure via a pathway including a device-native operating system (OS) and a superstructure-dedicated OS acting as an

15 intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application, and

the appearance and behavior of the application can be propagated with consistency across heterogeneous device types, to enable cross-device interoperability,
20 replicability, and compatibility of applications and data with a consistency of user experience.

42. The method of claim 3 wherein a first device can transmit to a second device a message containing an application event item, and thereby cause the second device
25 to place the application event item into a processing queue of the second device.

43. The method of claim 20 wherein application logic can be distributed across the network by obtaining a portion of the logic from the remote device and transmitting it in a hierarchical form to the server without the necessity of adapting code therefor.

44. The method of claim 20 further comprising providing updates to an application's state from the server to a remote device, by defining a minimal change set to the application's state and transferring it across the network from the server to the remote device, without the necessity of adapting code therefor.

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45. The method of claims 1, 2 or 3 further comprising incorporating media assets into the superstructure, for reference by running applications.

46. The method of claims 1, 2 or 3 further comprising incorporating by
10 reference media assets outside the superstructure, for reference by running applications.

47. A method for enabling, in a wireless messaging device operable to
communicate with a network serviced by a communications carrier, the creation,
15 modification, and management of platform-independent user interfaces and associated display elements, the method comprising:

generating a platform-independent data superstructure having a state defining a display state of the user interface,

instantiating in the wireless device ~~a messaging~~ an application including an
20 associated user interface, the behavior and state of the application and the associated user interface being defined by the superstructure,

updating, in response to generated application events, a segment of the superstructure associated with the application events, the application events including associated user interface events,

25 updating, in accordance with the superstructure segment update, the application state and user interface state in the wireless device,

whereby:

a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application, and

the look and behavior of the application can be propagated with consistency across a network of heterogeneous platforms and communications carrier protocols.

48. The method of claim 47 wherein:

5 the superstructure is an XML information structure,
 application appearance and behavior are encapsulated within the superstructure,
and

 application events are expressed to the superstructure via a pathway including a
device-native operating system (OS) and a superstructure-dedicated OS acting as an
10 intermediary between the device-native OS and the superstructure, whereby:

 a defined portion of the application can be addressed and updated in response to
application events without necessitating update of the entire application, and

 the appearance and behavior of the application can be propagated with
consistency across heterogeneous device types, to enable cross-device interoperability,
15 replicability, and compatibility of applications and data with a consistency of user
experience.

49. The method of claim 47 or 48 wherein, for a given state of a selected
application, the organization of the superstructure is substantially invariant, regardless
20 of the device, platform or device-native operating system environment in which the
associated application is instantiated, so as to maintain a consistent application
appearance and behavior across heterogeneous devices, platforms or device-native
operating system environments.

25 50. The method of claims 47 or 48 wherein the superstructure defines rules of
appearance and behavior of the application which are substantially invariant across
heterogeneous devices, platforms or device-native operating system environments.

51. The method of claims 47 or 48 wherein substantially identical application source code can be used across heterogeneous devices, platforms or device-native operating system environments.

5 52. The method of claims 47 or 48 wherein the application includes a user interface, and wherein the user interface has a substantially identical appearance and behavior across heterogeneous devices, platforms or device-native operating system environments.

10 53. The method of claim 48 wherein operation of the application is implemented through operations on the superstructure, and wherein the operation comprises:
receiving an application event in the device-native OS,
receiving data representative of the application event in the superstructure-dedicated OS,
15 applying to the superstructure, in response to the received data, a data object, thereby modifying the superstructure, and
operating the application in the device in accordance with the modified superstructure.

20 54. The method of claim 53 further comprising generating a modification data object representative of the modification to be applied to the superstructure,
translating the modification data object into a form suitable for processing by the device-native OS,
receiving in the device-native OS the translated modification data object, and
25 processing the translated modification data object in the application to update the application.

55. The method of claim 54 further comprising expressing within the superstructure a mechanism for generating the modification data object.

56. The method of claim 54 wherein modifying the superstructure includes transmitting a portion of the superstructure to a processor remote from the device, modifying the transmitted portion, and then returning the modified portion or a new set of operations to update the superstructure.

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57. The method of claim 54 wherein modifying the superstructure includes using device-native code to implement an interface to modify the superstructure.

58. The method of claim 54 wherein the application of changes to the superstructure is implemented by activating program instructions within the superstructure.

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59. The method of claims 47 or 48 further comprising validating the superstructure upon or after modification.

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60. The method of claim 48 further comprising validating the superstructure after modifying the superstructure, the validation including validation of data updated by processing of an event, so that the modified superstructure cannot express a harmful change to the device-native OS.

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61. The method of claim 47 or 48 further wherein an application defined by the superstructure can produce external changes only by invoking operations that operate on the superstructure.

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62. The method of claim 47 further including providing an interface between an application and a system service, wherein the interface is defined by interaction between the superstructure and the superstructure-dedicated OS.

63. The method of claims 47 or 48 wherein the superstructure can contain stylesheets for defining selected application or presentation characteristics.

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64. The method of claim 63 further comprising configuring stylesheets on a per-device basis.

5 65. The method of claim 63 further comprising configuring stylesheets on a per-group-of-devices basis.

66. The method of claim 63 further comprising expressing stylesheets within the superstructure, independent of device-specific limitations.

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67. The method of claim 63 further comprising selecting a stylesheet at runtime.

68. The method of claims 47 or 48 further comprising incorporating media assets into the superstructure, for reference by running applications.

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69. The method of claims 47 or 48 further comprising incorporating by reference media assets outside the superstructure, for reference by running applications.

70. The method of claim 47 wherein the application events include requests to
20 modify the user interface.

71. The method of claim 47 wherein the superstructure includes representations of a library of platform-independent user interface template elements, and the application events include requests for one or more template elements.

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72. The method of claim 71 wherein application events include requests to add, subtract, replace or otherwise modify elements of the user interface using template elements.

73. The method of claim 72 wherein application events include requests to enter user-defined content into the user interface.

5 74. The method of claim 47 wherein the superstructure is an XML data structure, and wherein user interface events are expressed to the superstructure via a pathway including a device-native operating system and a superstructure-dedicated operating system acting as an intermediary to the superstructure.

10 75. The method of claim 74 further comprising enabling the creation of templates at a remote processor for subsequent representation in the superstructure and instantiation in the wireless device.

15 76. The method of claim 75 wherein the remote processor is a personal computer.

77. The method of claim 47, further comprising configuring the user interface to respond to controls adapted to be actuated by a user's thumbs.

20 78. The method of claim 47 further comprising configuring the user interface to provide visual, sonic, tactile or other human-perceptible indications in response to commands entered by a user, or other application events.

25 79. The method of claim 47 further comprising configuring the user interface to enable a user to view, generate, send and manage messages.

80. The method of claim 79 further comprising configuring the user interface to enable a user to generate messages containing any of text, images, sound, or other media content.

81. In a digital processing device running at least one application in accordance with a superstructure-based application environment (SBAE), a method of updating the application, the method comprising:

transmitting, via a wireless communications channel accessible by the SBAE, an application update, the application update including a data object operable to update a segment of the superstructure in the SBAE,

receiving the data object, and

updating the application in accordance with the application update, and wherein: application appearance and behavior are encapsulated within and defined by the

superstructure, and

a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application.

82. The method of claim 81 further comprising updating an SBAE application across a plurality of devices by broadcasting application updates to the plurality of devices.

83. In a network of digital processing devices operable to communicate over a wireless communications channel, a method for enabling the creation and updating of applications, the method comprising:

generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

instantiating the application in the one or more digital processing devices in accordance with the superstructure,

updating the application state in the one or more devices, the updating including:

broadcasting to one or more of the devices in the network at least one application update,

receiving in the one or more devices the application update, and

updating, in the one or more devices, the running application, in accordance with received application update, and wherein:

application appearance and behavior are encapsulated within the superstructure, and

5 a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application.

84. In a network of digital processing devices operable to communicate over a wireless communications channel, a method for enabling the creation and updating of applications or data, the method comprising:

generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

15 instantiating the application in the one or more digital processing devices in accordance with the superstructure,

updating application state in the one or more devices, the updating including:

broadcasting to one or more of the devices in the network at least one update,

receiving in the one or more devices the update, and

20 updating, in the one or more devices, the running application, in accordance with received update, and wherein:

application appearance and behavior are encapsulated within the superstructure, and

a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application.

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85. The method of any of claims 82, 83 or 84 further comprising:

ensuring that each device is in a consistent, known state at the time of broadcasting and that the update remains whole and complete.

86. The method of any of claims 82, 83 or 84 further comprising:
broadcasting, in an all-or-nothing manner, only complete segments of application
update.

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87. In a superstructure-based application environment, a method of enabling
the storage and recovery of non-conversational data, the method comprising:

generating a data superstructure defining the appearance and behavior of an
application, the superstructure being serializable in whole or in part,

10 using an internal representation of the superstructure to store private data
relating to requests from the application or the state or data type of a superstructure
node, wherein the private data is not serialized when the application is paused, halted
or migrated, and is stored in a manner conveniently accessible at application runtime,
such that this non-conversational data is coherently recoverable so long as the private
15 data can be re-established upon de-serialization, based on public data that has been
maintained in the superstructure.

88. A method for enabling the creation, updating and management of platform-
independent applications and the storage and recovery of non-conversational data, the
20 method comprising:

generating a platform-independent data superstructure defining the appearance
and behavior of an application independent of characteristics of a digital processing
device on which the application is to be instantiated, wherein the superstructure can be
serialized in whole or in part at any time,

25 instantiating the application in the device in accordance with the superstructure,
updating, in response to generated application events, information in a segment
of the superstructure associated with the application events, the application events
including events generated by the application instantiated in the device and
representative of an application state, and

using an internal representation of the superstructure to store private data relating to requests from the application or the state or data type of a superstructure node, wherein the private data is not serialized when the application is paused, halted or migrated, and is stored in a manner conveniently accessible at application runtime, such that this non-conversational data is coherently recoverable so long as the private data can be re-established upon de-serialization, based on public data that has been maintained in the superstructure.

89. A method for enabling the creation and management of platform-independent applications, the method comprising:

generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

instantiating the superstructure in the device,

updating, in response to events associated with the application running in the device in accordance with the superstructure, information in a segment of the superstructure associated with the application, the events including events generated by the application and representative of an application state, and

updating, in accordance with the superstructure segment update, the application state in the device, wherein:

the superstructure is an XML information structure,

application appearance and behavior are encapsulated within the superstructure, and

events are expressed to the superstructure via a pathway including a device-native operating system (OS) and a superstructure-dedicated OS acting as an intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to events without necessitating update of the entire application, and

the appearance and behavior of the application can be propagated with

consistency across heterogeneous device types, to enable cross-device interoperability,

replicability, and compatibility of applications and data with a consistency of user experience.

90. A method for enabling the creation and management of platform-
- 5 independent applications, the method comprising:
- generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,
 - instantiating the superstructure in the device,
 - 10 updating, in response to events associated with the application running in the device in accordance with the superstructure, information in a segment of the superstructure associated with the application, the events including events generated by the application and representative of an application state, and
 - updating, in accordance with the superstructure segment update, the application
 - 15 state in the device, wherein:
 - the superstructure is a hierarchical information structure,
 - application appearance and behavior are encapsulated within the superstructure, and
 - events are expressed to the superstructure via a pathway including a device-
 - 20 native operating system (OS) and a superstructure-dedicated OS acting as an intermediary between the device-native OS and the superstructure, whereby:
 - a defined portion of the application can be addressed and updated in response to events without necessitating update of the entire application, and
 - the appearance and behavior of the application can be propagated with
 - 25 consistency across heterogeneous device types, to enable cross-device interoperability, replicability, and compatibility of applications and data with a consistency of user experience.

91. A system for enabling the creation and management of platform-independent applications, the system comprising:

means for generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

means for instantiating the superstructure in the device,

means for updating, in response to events associated with the application running in the device in accordance with the superstructure, information in a segment of the superstructure associated with the application, the events including events generated by the application and representative of an application state, and

means for updating, in accordance with the superstructure segment update, the application state in the device, wherein:

the superstructure is an XML information structure,

application appearance and behavior are encapsulated within the superstructure,

and

events are expressed to the superstructure via a pathway including a device-native operating system (OS) and a superstructure-dedicated OS acting as an intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to events without necessitating update of the entire application, and

the appearance and behavior of the application can be propagated with consistency across heterogeneous device types, to enable cross-device interoperability, replicability, and compatibility of applications and data with a consistency of user experience.

92. A system for enabling the creation and management of platform-independent applications, the system comprising:

means for generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

means for instantiating the superstructure in the device,
means for updating, in response to events associated with the application
running in the device in accordance with the superstructure, information in a segment
of the superstructure associated with the application, the events including events
5 generated by the application and representative of an application state, and

means for updating, in accordance with the superstructure segment update, the
application state in the device, wherein:

the superstructure is a hierarchical information structure,
application appearance and behavior are encapsulated within the superstructure,

10 and

events are expressed to the superstructure via a pathway including a device-
native operating system (OS) and a superstructure-dedicated OS acting as an
intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to
15 events without necessitating update of the entire application, and

the appearance and behavior of the application can be propagated with
consistency across heterogeneous device types, to enable cross-device interoperability,
replicability, and compatibility of applications and data with a consistency of user
experience.

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93. A system for enabling the creation and management of platform-
independent applications, the system comprising:

means for generating a platform-independent data superstructure defining the
appearance and behavior of an application independent of characteristics of a digital
25 processing device on which the application is to be instantiated,

means for instantiating the application in the device in accordance with the
superstructure,

means for updating, in response to generated application events, information in
a segment of the superstructure associated with the application events, the application

events including events generated by the application instantiated in the device and representative of an application state, and

means for updating, in accordance with the superstructure segment update, the application state in the device, wherein:

5 the superstructure is an XML information structure,

application appearance and behavior are encapsulated within the superstructure, and

application events are expressed to the superstructure via a pathway including a device-native operating system (OS) and a superstructure-dedicated OS acting as an

10 intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to application events without necessitating update of the entire application, and

the appearance and behavior of the application can be propagated with consistency across heterogeneous device types, to enable cross-device interoperability, replicability, and compatibility of applications and data with a consistency of user experience.

94. A system for enabling the creation and management of platform-independent applications, the system comprising:

20 means for generating a platform-independent data superstructure defining the appearance and behavior of an application independent of characteristics of a digital processing device on which the application is to be instantiated,

means for instantiating the application in the device in accordance with the superstructure,

25 means for updating, in response to generated application events, information in a segment of the superstructure associated with the application events, the application events including events generated by the application instantiated in the device and representative of an application state, and

means for updating, in accordance with the superstructure segment update, the application state in the device, wherein:

the superstructure is a hierarchical information structure,
application appearance and behavior are encapsulated within the superstructure,
and

application events are expressed to the superstructure via a pathway including a
5 device-native operating system (OS) and a superstructure-dedicated OS acting as an
intermediary between the device-native OS and the superstructure, whereby:

a defined portion of the application can be addressed and updated in response to
application events without necessitating update of the entire application, and

the appearance and behavior of the application can be propagated with
10 consistency across heterogeneous device types, to enable cross-device interoperability,
replicability, and compatibility of applications and data with a consistency of user
experience.